

2 a bushing having an interior bore including a plurality of equally spaced generally
3 T-shaped retainers axially extending in said interior bore and a like plurality of lobes between
4 adjacent generally T-shaped retainers;
5 a shaft rotatably supported within said interior bore of said bushing;
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6 a plurality of compliant foils, with an individual compliant foil disposed in said interior
7 bore of said bushing between adjacent generally T-shaped retainers; and
8 a plurality of foil undersprings, with an underspring disposed beneath each of said
9 compliant foils between adjacent generally T-shaped retainers.

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1 2. The compliant foil fluid film radial bearing of claim 1 wherein said interior bore
2 is cylindrical and said individual compliant foils and said individual foil undersprings beneath
3 said individual compliant foils establish a converging wedge between adjacent generally
4 T-shaped retainers.

1 3. The compliant foil fluid film radial bearing of claim 1 wherein said interior bore
2 is non-cylindrical generally contoured lobes are formed between adjacent generally T-shaped
3 retainers, and said individual compliant foils and said individual foil undersprings generally
4 conform to the shape of said contoured lobes to establish a converging wedge.

1 4. A compliant foil fluid film radial bearing comprising:
2 a bushing having a cylindrical interior bore including a plurality of equally spaced
3 retainers axially extending into said interior bore and a like plurality of arc segments between
4 adjacent retainers;
5 a shaft rotatably supported within said interior bore of said bushing;

6 a plurality of compliant foils, with an individual compliant foil disposed in said interior
7 bore of said bushing in each arc segment between adjacent retainers; and
8 a plurality of foil undersprings, with an underspring disposed beneath each of said
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9 compliant foils in each arc segment between adjacent retainers, the radial height of said foil
10 undersprings increasing from its leading edge to its trailing edge to establish a converging wedge
11 on the surface of said compliant foil facing said shaft.

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1 5. The compliant foil fluid film radial bearing of claim 4 wherein said retainers are
2 generally T-shaped.

1 6. The compliant foil fluid film radial bearing of claim 5 wherein said generally
2 T-shaped retainers are symmetrical.

1 7. The compliant foil fluid film radial bearing of claim 5 wherein said generally
2 T-shaped retainers are asymmetrical.

1 8. The compliant foil fluid film radial bearing of claim 7 wherein said generally
2 T-shaped asymmetrical retainers have a crosspiece with a leading edge and a trailing edge, with
3 the leading edge thicker than the trailing edge.

1 9. The compliant foil fluid film radial bearing of claim 4 wherein the radial stiffness
2 of said foil undersprings increases from its leading edge to its trailing edge.

1 10. The compliant foil fluid film radial bearing of claim 9 wherein said bearing is
2 hydrodynamic.

1 11. The compliant foil fluid film radial bearing of claim 9 wherein said retainers are
2 generally T-shaped.

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1 12. The compliant foil fluid film radial bearing of claim 9 wherein said bearing is
2 hydrostatic.

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1 13. A compliant foil fluid film radial bearing comprising:
2 a bushing having a non-cylindrical interior bore including a plurality of equally spaced
3 retainers axially extending into said interior bore and a like plurality of contoured lobes between
4 adjacent retainers;

5 a shaft rotatably supported within said interior bore of said bushing;
6 a plurality of compliant foils, with an individual compliant foil disposed in said interior
7 bore of said bushing in each contoured lobe between adjacent retainers; and

8 a plurality of foil undersprings, with an underspring disposed beneath each of said
9 compliant foils in each contoured lobe between adjacent retainers, the contour of each lobe
10 between adjacent retainers establishing a converging wedge on the surface of said compliant foil
11 facing said shaft.

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14. (Once Amended) The compliant foil fluid film radial bearing of claim ¹⁴~~56~~ wherein
2 said generally T-shaped retainers are symmetrical.

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15. The compliant foil fluid film radial bearing of claim 16 wherein said generally
2 T-shaped asymmetrical retainers have a crosspiece with a leading edge and a trailing edge, with
3 the leading edge thicker than the trailing edge.

1 16. (Once Amended) The compliant foil fluid film radial bearing of claim 56 wherein
2 said generally T-shaped retainers are asymmetrical.

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1 17. (Once Amended) The compliant foil fluid film radial bearing of claim 56 wherein
2 said generally T-shaped retainers include radial openings to provide cooling flow to said interior
3 bore of said bushing.

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1 18. The compliant foil fluid film radial bearing of claim 13 and in addition means to
2 provide cooling flow axially into said interior bore of said bushing.

1 19. A compliant foil fluid film radial bearing comprising:
2 a bushing having an interior bore including a plurality of generally T-shaped retainers
3 axially extending in said interior bore;
4 a plurality of compliant foils, with an individual compliant foil disposed in said interior
5 bore of said bushing between adjacent generally T-shaped retainers; and
6 a plurality of foil undersprings, with an underspring disposed beneath each of said
7 compliant foils between adjacent generally T-shaped retainers.

1 20. The compliant foil fluid film radial bearing of claim 19 wherein said interior bore
2 is cylindrical and said individual compliant foils and said individual foil undersprings beneath
3 said individual compliant foils establish a converging wedge between adjacent generally
4 T-shaped retainers.

1 21. The compliant foil fluid film radial bearing of claim 19 wherein said interior bore
2 is non-cylindrical, generally contoured lobes are formed between adjacent generally T-shaped

3 retainers, and said individual compliant foils and said individual foil undersprings generally
4 conform to the shape of said contoured lobes to establish a converging wedge.

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22. The compliant foil fluid film radial bearing of claim ²⁰ ~~19~~ wherein said bearing is
2 hydrodynamic.

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23. The compliant foil fluid film radial bearing of claim ²⁰ ~~19~~ wherein said bearing is
2 hydrostatic.

1 24. The compliant foil fluid film radial bearing of claim ²⁰ ~~19~~ wherein said generally
2 T-shaped retainers include radial openings to provide cooling flow to said interior bore of said
3 bushing.

1 25. The compliant foil fluid film radial bearing of claim ²⁰ ~~19~~ further comprising:
2 means to provide cooling flow axially into said interior bore of said bushing.

1 ²⁷ 26. A compliant foil fluid film radial bearing comprising:
2 a bushing having a cylindrical interior bore including a plurality of retainers axially
3 extending into said interior bore;
4 a plurality of compliant foils, with an individual compliant foil disposed in said interior
5 bore of said bushing between adjacent retainers; and
6 a plurality of foil undersprings, with an underspring disposed beneath each of said
7 compliant foils between adjacent retainers, the radial height of said foil undersprings increasing
8 from its leading edge to its trailing edge to establish a converging wedge of said compliant foil.

1 ²⁸ 27. The compliant foil fluid film radial bearing of claim ²⁷ ~~26~~ wherein said retainers are
2 generally T-shaped.

1 28. The compliant foil fluid film radial bearing of claim 27 wherein said generally

2 T-shaped retainers are symmetrical.

1 29. The compliant foil fluid film radial bearing of claim 27 wherein said generally

2 T-shaped retainers are asymmetrical.

1 30. The compliant foil fluid film radial bearing of claim 29 wherein said generally

2 T-shaped asymmetrical retainers have a crosspiece with a leading edge and a trailing edge, with
3 the leading edge thicker than the trailing edge.

1 31. The compliant foil fluid film radial bearing of claim 26 wherein the radial

2 stiffness of said foil undersprings increases from its leading edge to its trailing edge.

1 32. The compliant foil fluid film radial bearing of claim 31 wherein said bearing is

2 hydrodynamic.

1 33. The compliant foil fluid film radial bearing of claim 31 wherein said bearing is

2 hydrostatic.

1 34. The compliant foil fluid film radial bearing of claim 27 wherein said generally

2 T-shaped retainers include radial openings to provide cooling flow to said interior bore of said
3 bushing.

1 35. The compliant foil fluid film radial bearing of claim 26 further comprising:

2 means to provide cooling flow axially into said interior bore of said bushing.

1 36. A compliant foil fluid film radial bearing comprising:

2 a bushing having a non-cylindrical interior bore including plurality of retainers axially
3 extending into said interior bore;
4 a plurality of compliant foils, with an individual compliant foil disposed in said interior
5 bore of said bushing between adjacent retainers; and
6 a plurality of foil undersprings, with an underspring disposed beneath each of said
7 compliant foils between adjacent retainers, the contour of the interior bore between adjacent
8 retainers establishing a converging wedge on the surface of said compliant foil.

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1 39 37. The compliant foil fluid film radial bearing of claim 36 wherein said retainers are
2 generally T-shaped.

1 44 38. The compliant foil fluid film radial bearing of claim 37 wherein said generally
2 T-shaped retainers are asymmetrical.

1 45 39. The compliant foil fluid film radial bearing of claim 38 wherein said generally
2 T-shaped asymmetrical retainers have a crosspiece with a leading edge and a trailing edge, with
3 the leading edge thicker than the trailing edge.

1 40. The compliant foil fluid film radial bearing of claim 37 wherein said generally
2 T-shaped retainers are symmetrical.

1 41. The compliant foil fluid film radial bearing of claim 37 wherein said bearing is
2 hydrodynamic.

1 42. The compliant foil fluid film radial bearing of claim 37 wherein said bearing is
2 hydrostatic.

1 43. The compliant foil fluid film radial bearing of claim ³⁹ 37 wherein said generally
2 T-shaped retainers include radial openings to provide cooling flow to said interior bore of said
3 bushing.

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1 44. The compliant foil fluid film radial bearing of claim ³⁷ 36 further comprising:
2 means to provide cooling flow axially into said interior bore of said bushing.

1 45. A radial bearing bushing comprising:
2 a bushing having an interior bore;
3 one or more retainer bases axially extending into the interior bore;
4 one or more leading edges attached to each of the one or more retainer bases for retaining
5 a compliant foil; and
6 one or more trailing edges attached to each of the one or more retainer bases for retaining
7 a compliant foil.

1 46. The radial bearing bushing of claim ⁴⁹ 45 wherein one or more of the one or more
2 retainer bases include radial openings to provide cooling flow to said interior bore of said
3 bushing.

1 47. The radial bearing bushing of claim ⁴⁶ 45 wherein the interior bore is cylindrical.

1 48. The radial bearing bushing of claim ⁴⁶ 45 wherein the interior bore is
2 non-cylindrical.

1 49. A compliant foil radial bearing comprising:

2 a bushing having an interior bore including one or more retainer bases axially extending
3 into the interior bore;
4 one or more compliant foils
5 one or more leading edges attached to each of the one or more retainer bases for retaining
6 a compliant foil trailing edge; and
7 one or more trailing edges attached to each of the one or more retainer bases for retaining
8 a compliant foil leading edge; and

one or more foil undersprings, each underspring disposed beneath a compliant foil.

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1 56 50. The compliant foil radial bearing of claim 49 wherein the interior bore is
2 cylindrical and an individual compliant foil and underspring beneath the individual compliant
3 foil form a converging wedge.

1 51. The compliant foil radial bearing of claim 49 wherein the interior bore is
2 non-cylindrical generally contoured lobes are formed between adjacent retainer bases, and an
3 individual compliant foil and underspring beneath the individual compliant foil generally
4 conform to the shape of a contoured lobe to establish a converging wedge.

1 52. The compliant foil radial bearing of claim 49 wherein said bearing is
2 hydrodynamic.

RR 1 53. The compliant foil radial bearing of claim 49 wherein said bearing is hydrostatic.

1 54. The compliant foil radial bearing of claim 49 wherein the one or more retainer
2 bases include radial openings to provide cooling flow to the interior bore of said bushing.

1 55. The compliant foil radial bearing of claim 49 further comprising: